ASBESTOS SURVEY REPORT

Department of Veterans Affairs Medical Center
Denver, Colorado
Buildings: 1, C, 4, 6, 7, 8, 18, 19, 20, 21, 24, 25, 26, 38 and 39

Department of Veterans Affairs

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Hazard Rank # 1				Damaged or significantly damaged ACBM with a high disturbance potential. These materials require immediate isolation, removal, repair, encapsulation and/or enclosure.					
Building No.	**Building Name**	**Room No.**	**Material Code(1)**	**Material Description**	**Quantity**	**Hazard Rank**	**Material Comments**	**Recommended Response Actions**	**Cost Estimate for Response Actions**
19	Research Facility	Floor 2	T02.A	Hard Fittings	465 ln. ft.	1	Sample in Rm 206 -- located above ceiling tiles in 206, 206A, 205, 207, 204, crossing C2-1 --- Samples sent in 9/21	Remove	[redacted]

Hazard Rank # 2				Damaged or significantly damaged ACBM with a low to moderate disturbance potential. These materials require removal, repair, encapsulation and/or enclosure.					
Building No.	**Building Name**	**Room No.**	**Material Code(1)**	**Material Description**	**Quantity**	**Hazard Rank**	**Material Comments**	**Recommended Response Actions**	**Cost Estimate for Response Actions**
18	Grounds Shop/Storage	Floor 1	M11.A	Window Caulking	100 ln. ft.	2	<100 ln ftSample in Rm 101 -- 1st positive stop on all samples -- 6% white caulk w/ white paint, 94% white resinous material w/ white paint	Remove or Repair and place in O&M plan	[redacted]
19	Research Facility	Floor 1	F03.C	12x12 Floor Tile - brown with white streaks	36 sq. ft.	2	Sample in Rm C1-6	Remove	
19	Research Facility	Floor 2	F03.F	12x12 Floor Tile - grey with green speckles	112 sq. ft.	2	Sample in Rm 213 -- 3% black mastic, 97% cream floor tile	Remove or Repair and place in O&M plan	
21	Research Facility	Sub-Basement	M17.B	white vapor barrier sealant	100 ln. ft.	2	<100 ln ft	Remove	

Executive Summary

Response Actions and Cost Estimates
for Asbestos-Containing Building Materials with Hazard Ranks of 1, 2, or 3

Hazard Rank # 2				**Damaged or significantly damaged ACBM with a low to moderate disturbance potential. These materials require removal, repair, encapsulation and/or enclosure.**					
Building No.	**Building Name**	**Room No.**	**Material Code(1)**	**Material Description**	**Quantity**	**Hazard Rank**	**Material Comments**	**Recommended Response Actions**	**Cost Estimate for Response Actions**
6	Engineering Shop	Floor 1	M17.D	Window putty	500 ln. ft.	2	<500 ln ft -- Sample in Rm 103, 104	Remove or Repair and place in O&M plan	[redacted]
6	Engineering Shop	Roof	M11.A	White sealant caulking	100 ln. ft.	2	<100 ln ft -- 1st positive stop on all samples	Remove	
6	Engineering Shop	Roof	M11.B	Seam caulking - white	100 ln. ft.	2	<100 ln ft	Remove	

(1) Material Codes: T - Thermal Systems Insulation; F - Floor Covering; S - Surfacing Material (Sprayed or Troweled-on); M - Miscellaneous Material

1.0 INTRODUCTION AND SCOPE OF WORK

During September 14 through October 15, 2010, Buys and Associates, Inc. (B&A) conducted an asbestos survey of thirteen buildings on the Department of Veterans Affairs (VA) Medical Center campus, located at 1055 Clermont Street in Denver, Colorado. Mr. Craig Bagley with the Department of Veterans Affairs, contracted and requested this inspection to identify Asbestos Containing Building Materials (ACBMs). According to the Statement of Work provided by the Department of Veterans Affairs, the buildings to be surveyed at the Denver VA included buildings 1, C, 4, 6, 7, 8, 18, 19, 20, 21, 24, 25, 26, 38 and 39.

The objective of this inspection was to perform a comprehensive survey to determine the presence and condition of all ACBM and to recommend response actions for the materials identified. The scope of work for this inspection was outlined in solicitation VA-259-10-RQ-0236.

- Perform a comprehensive survey (inspection and assessment) of selected facilities (and portions of facilities) to determine the presence of asbestos-containing materials (ACM) according to Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA) and State of Colorado rules and regulations, and VA Directives.
- Conduct an Asbestos Assessment of every accessible space in the selected facilities (and portions of facilities).
- Prepare a written report of findings with tables outlining the quantities, types, and locations of ACM, as well as a hazard ranking, recommended response action, and associated cost estimate of implementation of those response actions. In addition, contractor is to provide color CAD drawings identifying the sample locations, and material locations.

- Write an Operations and Maintenance plan that addresses procedures for maintaining existing ACM and implementing the OSHA asbestos notification requirements for building occupants.
- Create a facility database that the VA Engineering staff can query for tabular information about the locations, quantity, damage, access/damage potential, and recommended response actions for the ACMs identified during the survey.

To accomplish this survey, B&A identified all accessible areas in each building by name and room number. **Table 3 and 5** in **Appendices A through Q** identifies the functional spaces, materials, quantities, condition, hazard ranking, and any recommended response actions.

The specific buildings (and portions of buildings) included in this survey are:

- Building 1 (all accessible areas)
- Building C (all accessible areas)
- Building 4 (all accessible areas)
- Building 6 (all accessible areas)
- Building 7 (all accessible areas)
- Building 8 (all accessible areas)
- Building 18 (all accessible areas)
- Building 19 (all accessible areas)
- Building 20 (all accessible areas)
- Building 21 (all accessible areas)
- Building 24 (all accessible areas)
- Building 25 (all accessible areas)

- Building 26 (all accessible areas)
- Building 38 (all accessible areas)
- Building 39 (all accessible areas)

2.0 INSPECTION PROCEDURES

The asbestos survey was performed using the applicable portions of the currently recognized standard protocol developed for schools under Asbestos Hazard Emergency Response Act (AHERA), as promulgated in Title 40, Code of Federal Regulations (40 CFR), Part 763 and as amended in the Federal Register.

2.1 Building Inspection and Sampling

The building inspections were conducted by Colorado-accredited inspectors and consisted of a detailed visual inspection and assessment of the condition and potential for disturbance of suspect asbestos-containing building materials (ACBM). The specific components of the inspection and assessment included:

- Identification and inspection of materials by functional space. Summaries of the suspect materials identified are presented in the **Data Tables** in the appendices for each building.
- An assessment of suspect, known, or assumed ACBM.
- Identifying suspect ACBM's by material type, with a unique identifier. The 4 groups are thermal system insulation (TSI), surfacing materials, miscellaneous materials, and floor covering.

  B&A uses a standardized numbering system to identify Homogeneous Materials during the survey. Letters T, F, S, or M designate material types as follows:

  - Thermal Insulation (pipe insulation, fittings, etc.): T01 - T10 (example: T02.2 Hard Pipe Insulation)

- Floor Covering (floor tile, sheet vinyl, mastics and adhesives, floor leveling compounds, cove base, etc.): F01 - F07 (example: F04.4: 9"x9" Floor Tile – Gray)
- Surfacing Materials (texturing and fire-proofing): S01 - S02
- Miscellaneous Materials (roofing, sink undercoating, gypsum board, etc.): M01 – M17 (example: M10.1: Gray Window Caulk)

2.2 Bulk Sampling

Inspectors collected bulk samples of suspect ACBM and submitted the samples to an accredited laboratory for analysis. Bulk sample numbers are included in the **Bulk Sample Log (Table 4)** in the appendices for each building.

- B&A conducted its sampling in a manner that minimized damage to the building, did not leave unsightly marks, and did not create a health hazard for the inspector or building occupants.
- The number of samples collected from each homogeneous area generally followed the AHERA rules.
- Friable surfacing materials were sampled using the random sampling scheme given in the EPA publication 560/5-85-030a, titled "*Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials*."
- Unique sample numbers were assigned to each sample collected during the inspection. The numbers assigned to bulk samples included the Building and Room Number and the Homogenous Material sampled (example: VA3-001 M10.1 – Red Caulk). These numbers were entered on chain-of-custody forms that accompanied the bulk samples to the analytical laboratory.
- Locations of bulk samples and confirmed ACBM are identified on the **Building Floor Plans** in the appendices for each building.
- Each material identified and sampled was photographed with a unique identification number inside the photo. These photos will be viewable in the database that will accompany this report.

2.3 Bulk Sample Analysis

Bulk samples were analyzed using polarized light microscopy (PLM) and visual estimation according to the EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples, EPA-600/M4-82-020. The quantification of asbestos in a sample is intended to be an estimate only and the limit of detection for this method is approximately 1% by volume.

Samples were analyzed by Reservoirs Environmental, Inc. (REI) in Denver, Colorado. REI is accredited under the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NIST-NVLAP) for bulk asbestos sample analysis, and is also accredited by the American Industrial Hygiene Association (AIHA). The laboratory reports are included inthe appendices for each building..

EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP) and AHERA regulations define ACM as material containing greater than 1% asbestos by weight; materials containing 1% or less asbestos are not considered regulated ACM by the EPA. Further, the NESHAP regulations state that any sample found to contain less than 10% asbestos but greater than "none detected," by the visual estimation method used during PLM analysis, must be assumed to contain greater than 1% asbestos unless confirmed by NESHAP point counting analysis.[1]

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[1] NESHAP point counting procedures are outlined in the EPA "Interim" Bulk Method. For each layer of a material to be point-counted, eight mounts are made by dispersing 8 pinches of a sample in suitable fluid. Each of the mounts is examined under a polarizing microscope using an eyepiece reticule that superimposes a grid of points over the field of view. Fifty non-empty points are examined for each mount, yielding 400 points, some of which will be identified as asbestos and some not. The percentage of asbestos is determined by comparing the number of positive points to the number counted. For example, 4 positive points out of 400 equals 1.0% asbestos.

3.0 SURVEY FINDINGS

3.1 ACMs

ACBM is identified in **Tables 1-5, the Building Floor Plans, and the Laboratory Analytical Results in Appendices C through Q**. These tables describe the type of material, visual appearance, condition, friability, potential for disturbance, and identify any materials that require immediate actions.

3.2 Non-ACBM

Suspect materials are identified as non-ACBM if the material contains no detectable asbestos. **Tables 2 and 3 in Appendices C through Q** identify the non-ACM materials. Non-ACM material quantities are included in **Table 2**.

3.3 Damage and Hazard Assessment

Each ACM was assessed for damage, accessibility, and the potential for future damage. This information is presented in **Table 3**, located in **Appendices C through Q**.

3.3.1 Hazard Rank Codes

Hazard Rank Codes were determined by assessing the material condition, accessibility, and potential for future disturbance. ACBM materials, including those that contain less than 1% but greater than none detected, were assigned a Hazard Rank Code 1, 2, 3 or 4. A Hazard Rank Code of 1 requires some immediate response action. Materials assigned a Hazard Rank Code 4 do not pose a significant risk and do not require immediate response. The **Executive Summary Table** outlines the recommended response actions that accompany Hazard Rank Codes 1 through 3.

- **Hazard Ranking Code 1 Materials** – These materials are damaged or significantly damaged ACBM with a high fiber release potential. These materials require immediate isolation, removal, repair, encapsulation and/or enclosure by a Colorado-certified asbestos abatement contractor.

- **Hazard Ranking Code 2 Materials** – These materials are damaged or significantly damaged ACBM with a low to moderate fiber release potential. These materials require removal, repair, encapsulation and/or enclosure by a Colorado-certified asbestos abatement contractor.
- **Hazard Ranking Code 3 Materials** – These materials are intact (in good condition), but present a high potential for disturbance. These materials may be removed, enclosed, and/or labeled, **or** they may be managed in place in the Operations and Maintenance Plan. B&A recommends that any intentional contact with ACBM be performed by a Colorado-certified asbestos abatement contractor.
- **Hazard Ranking Code 4 Materials** – These materials are intact (in good condition), and present a low to moderate potential for disturbance and can be managed under the Operations and Maintenance Plan. They should be inspected periodically, however, to ensure they do not deteriorate.

3.4 Special Considerations

Materials with peculiar configurations or that are hidden or obscured, materials or areas that were inaccessible to our inspectors, and materials assumed to be asbestos-containing will be identified in **Table 3** in each of the building appendices.

Roofing materials were sampled when it was clear that such sampling would not compromise the integrity of the roof. At the request of the VA Engineering Staff, we did not sample any materials associated with membrane roofs during this survey.

The roofing materials on the following buildings were not sampled:

- Building 1 (Assumed ACM)
- Building C (Assumed ACM)
- Building 4 (Assumed ACM)
- Building 6 (Assumed ACM)
- Building 7 (Membrane or Non-Suspect)
- Building 8 (Membrane or Non-Suspect)
- Building 18 (Membrane or Non-Suspect)

- Building 19 Membrane or Non-Suspect)
- Building 20 (Assumed ACM)
- Building 21 (Membrane or Non-Suspect)
- Building 24 (Membrane or Non-Suspect)
- Building 25 (Membrane or Non-Suspect)
- Building 26 (Membrane or Non-Suspect)
- Building 38 (Assumed ACM)
- Building 39 (Assumed ACM)

3.5 Inaccessible Areas

Suspect materials that were hidden or inaccessible may not have been characterized by this inspection. Therefore, any material not identified in this report as having been tested should be treated as suspect ACM until it has been sampled by a Colorado-certified inspector and analyzed by an accredited laboratory applying EPA methods.

In addition, some building structures may have been constructed after the application of ACM, and therefore may have obscured these materials from visual examination during this inspection. Typical scenarios include thermal system insulation inside hardened mechanical chases, floor tile, and mastic under walls, and sprayed on texturing and/or fireproofing behind structural supports or architectural features.

3.5.1 Structural Mechanical Enclosures

The interior contents of structural mechanical enclosures (hardened chases) were inspected where possible. The chases throughout the building we inspected can be grouped into 3 categories: 1) those that have never been accessed and contain asbestos-containing thermal system insulation, 2) those located within a functional space (floor or section of the building) that has not undergone asbestos removal, but has been abated in

conjunction with a pipe leak or other repair operation, and 3) those located in areas wherein large scale abatement projects have been conducted.

We inspected the interior contents of most of the hardened chases we encountered. The ACBM in some of these hardened chases has been removed; however, many still contain ACBM, including some hardened chases in areas where large scale asbestos abatement was performed before renovation activities.

3.5.1.1 Recommendation

Prior to demolishing any hardened chase, attempt to inspect the contents to determine if it contains ACBM. If you cannot determine the contents, demolition should be performed applying the requirements of VA Specifications for asbestos abatement.

4.0 Applicable Rules and Regulations

In Colorado, EPA asbestos regulations are administered by the CDPHE.[2] OSHA is responsible for administering OSHA regulations in the state of Colorado.

4.1 Renovation and Demolition (EPA and OSHA)

NESHAP regulations require the removal of friable ACM and non-friable ACM that could become friable during demolition activities.

Despite EPA and CDPHE rules exempting building materials containing 1% or less asbestos from stringent regulation, OSHA regulations outline specific precautionary work practices when employees work with materials containing any detectable amounts of asbestos. Strict compliance by building owners with the OSHA asbestos regulations may result in response actions not required by the EPA and the CDPHE for certain unregulated materials.

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[2] Colorado - REGULATION NO. 8 - The Control of Hazardous Air Pollutants PART B THE CONTROL OF ASBESTOS 5 CCR 1001-10, Part B.

5.0 COST ESTIMATES FOR REMOVAL

The Cost Estimates for Response Actions included in the Executive Summary and Operations and Maintenance Plan Tables only address the costs associated with response actions in specific rooms or functional spaces (i.e., materials assigned a Hazard Rank of 1 through 3). The Material Removal Unit Cost Estimates Table below outlines the estimated removal costs associated with all of the various homogeneous materials identified during this survey, including Hazard Ranking 4 materials (i.e., those materials that are in good condition and have a low potential for disturbance), which were not included in the Executive Summary table.

Material Removal Unit Cost Estimates

Materials	Locations	Estimated. Quantity*	Unit Removal Cost Estimate
Floor Tile	1, 6, 19, 21	15,500 SF	[redacted]
Pipe Insulation	1	2,000 LF	
Pipe Fittings	1, 19	650 EA	
Transite	19	6 SF	
Caulk	4, 6, 8, 19, 20, 21	1,000 LF	
Window Glazing	8	1,000 LF	
Expansion Collars (HVAC)	6, 19	70 SF	
Gasket Material	8	1,000 EA	
Sink Undercoating	21	6 EA	
Baseboard Mastic	21	40 LF	
Drywall	1, 21	3,000 SF	
Plaster	1, 6	1,700 SF	
Duct Insulation	1	100 LF	
Spray on Fire Proofing	21	3,800 SF	

*SF – square foot; LF – linear foot; EA – each; OD – outside diameter

5.1 Cost Estimate Limitations

These cost estimates are provided for use in long-term budgeting and planning only, and do not have a level of accuracy sufficient to be used as a construction design cost estimate. The actual cost of asbestos removal is highly dependent on a number of factors such as the size of the job (single room or mechanical enclosure, or an entire floor or building); the required time frame for removal; the time of year the job is conducted; and travel time and distance to the job for the contractor. Therefore, actual removal costs could vary significantly from these estimates.

We have attempted to capture the range of costs in our Unit Removal Cost Estimate. Materials replacement and consultant abatement management costs are not included in these estimates and can add 15 - 50% to the project costs.

6.0 PROJECT LIMITATIONS

This project was performed using, as a minimum, practices consistent with standards acceptable within the industry at this time, and a level of diligence typically exercised by EH&S consultants performing similar services.

The procedures used attempt to establish a balance between the competing goals of limiting investigative and reporting costs and time, and reducing the uncertainty about unknown conditions. Therefore, because the findings of this report were derived from the scope, costs, time and other limitations, the conclusions should not be construed as a guarantee that all universal, toxic and/or hazardous wastes have been identified and fully evaluated. Furthermore, B&A assumes no responsibility for omissions or errors resulting from inaccurate information, or data, provided by sources outside of B&A or from omissions or errors in public records.

It is emphasized that the final decision on how much risk to accept always remains with the client since B&A is not in a position to fully understand all of the client's needs. Clients with a greater aversion to risk may want to take additional actions while others, with less aversion to risk, may want to take no further action.

EXECUTIVE SUMMARY

During September 14 through October 15, 2010, Buys and Associates, Inc. (B&A) conducted an asbestos survey of thirteen buildings on the Department of Veterans Affairs (VA) Medical Center campus, located at 1055 Clermont Street in Denver, Colorado. Mr. Craig Bagley with the Department of Veterans Affairs, contracted and requested this inspection to identify Asbestos Containing Building Materials (ACBMs). According to the Statement of Work provided by the Department of Veterans Affairs, the buildings to be surveyed at the Denver VA included buildings 1, C, 4, 6, 7, 8, 18, 19, 20, 21, 24, 25, 26, 38 and 39. The objective of this inspection was to perform a comprehensive survey to determine the presence and condition of all ACBM and to recommend response actions for the materials identified. The following materials were identified as requiring a response.

RECOMMENDATIONS

Hazard Rank Codes – all of the ACBM materials, including those that contain less than 1% but greater than none detected, were assigned a Hazard Rank Code 1, 2, 3 or 4. A Hazard Rank Code of 1 requires some immediate response action. Materials assigned a Hazard Rank Code 4 are those ACBMs that do not pose a significant risk and do not require immediate response. Hazard Rank Codes were determined by assessing the material condition, accessibility, and potential for future disturbance. The Executive Summary Table above outlines the recommended response actions that accompany Hazard Rank Codes 1 through 3.

- **Hazard Ranking Code 1 Materials** – These materials are damaged or significantly damaged ACBM with a high fiber release potential. These materials require immediate isolation, removal, repair, encapsulation and/or enclosure by a Colorado-certified asbestos abatement contractor.

- **Hazard Ranking Code 2 Materials** – These materials are damaged or significantly damaged ACBM with a low to moderate fiber release potential. These materials require removal, repair, encapsulation and/or enclosure by a Colorado-certified asbestos abatement contractor.
- **Hazard Ranking Code 3 Materials** – These materials are intact (in good condition), but present a high potential for disturbance. These materials require removal, enclosure, and/or labeling, or may be managed in the Operations and Maintenance Plan through more frequent periodic inspections. B&A recommends that any abatement actions be performed by a Colorado-certified asbestos abatement contractor.

Operations and Maintenance Plan – the VA Engineering staff should implement the Operations and Maintenance Plan provided with this report immediately. This plan assigns responsibility for program management and coordination and institutes a formal system for coordinating building construction or maintenance activities so that asbestos-containing materials are not inadvertently disturbed.

Cost Estimates for Removal – the Cost Estimates for Response Actions included in the Executive Summary Table above only addresses the costs associated with response actions in specific rooms or functional spaces (i.e., materials assigned a Hazard Rank of 1 through 3). The Material Removal Unit Cost Estimates Table in Section 5 in the body of the report outlines the estimated removal costs associated with all of the various homogeneous materials identified during this survey, including Hazard Ranking 4 materials (i.e., those materials that are in good condition and have a low potential for disturbance), which were not included in the Executive Summary table.

The cost estimates below are provided for use in long-term budgeting and planning only, and do not have a level of accuracy sufficient to be used as a construction design cost estimate. The actual cost of asbestos removal is highly dependent on a number of factors such as the size of the job (single room or mechanical enclosure, or an entire floor or building); the required time frame for removal; the time of year the job is conducted; and travel time and distance to the job for the contractor. Therefore, actual removal costs could vary

significantly from these estimates. We have attempted to capture the range of costs in our Unit Removal Cost Estimate. Materials replacement and consultant abatement management costs are not included in these estimates and can add 15 - 50% to the project costs.

The report that follows this Executive Summary should be read in its entirety because it includes important information, such as material descriptions and locations, regulatory requirements, and building specific recommended response actions.